Working Papers in Management
Birkbeck, Department of Management

BWPMA 1304

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June 2013

ISSN 2052 – 0581

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Is Acting Prosocially Beneficial for the Credit Market?*

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Abstract

This article argues that behaving prosocially implies more transparent information during the negotiation process of a financial contract and more cooperation among the parties to respect the terms of the contract. For this reason this work considers interest rate on loans and insolvency rate functions of prosocial behaviour along with the traditional socio-economic and financial collaterals. The context of study is Italy and the analysis is developed at a cross-regional level. We collect data from the two reports on "Relatives and Safety Net" produced by the Italian Centre Bureau of Statistics (ISTAT) in 1998 and 2003 and from the reports on "Regional Economics" produced by the Bank of Italy in the same years. A two-period panel model shows two interesting outcomes. Firstly, regions with a higher proportion of prosocial individuals report lower interest rates on loans and insolvency rates. Secondly, when we include the efficiency of legal enforcement, evidence supports the idea that a more efficient legal framework can act as a more reliable transmission mechanism of institutional norms and facilitate the internalisation of social norms.

Keywords: Prosocial Behaviour, Legal Enforcement, Two-Period Panel
JEL Classification: G20, K42, R11, Z13,

*We are grateful to Klaus Nielsen, Federica Rossi, Asimina Christoforou and Ron Smith for useful comments. Financial support from the Economics and Social Research Council (award PTA-031-2006-00459) is greatly acknowledged
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1. Introduction

Prosocial individuals tend to assume a cooperative behaviour and to maximise the joint outcome even when this implies to incur in personal costs (Bogaert, Boone and Declerck 2008). This work aims to test whether contexts populated by more prosocial individuals experience less credit market imperfections in the sense of lower bank interest rates for lending to residents and lower insolvency rates. The context of study is Italy and the analysis is developed at a cross-regional level.

Italy represents an interesting case study due to differences existing among the Italian regions in terms of features of social organisations such as trust and social norms (Putnam; 1993). According to Putnam, this regional heterogeneity should be attributed to different historical institutional patterns that the regions experienced the country unification in 1861. One of the most peculiar issues is that these cross-regional differences seem to be still present nowadays, even though all the regions are subject to the same formal institutions such as rules of law, constitution, civil and criminal codes.

Given this framework, it seems quite plausible to believe that the cross-regional heterogeneity can better capture the impact of the cooperative nature of the individuals on the credit market.

Credit market imperfections are characterised by asymmetric information between the lender and the borrower about the validity of a project to be financed. The conventional scenario is that the borrower has more information on the quality and the riskiness of the project, which he/she is not always willing to share with the lender. This occurs especially during the negotiation of the terms of the financial contract. This omitted information might reveal the effective riskiness of the project or the effective ability of the borrower to repay the fund. In both of the cases, this drives the lender to solve an adverse selection problem (i.e., to avoid the selection of individuals that propose bad quality and risky projects) or decide to ascertain the quality and riskiness of the project. However, this implies higher monitoring costs and, hence, requires a higher return to compensate the lender from the additional costs. These conditions of uncertainty lead the lender to increase the interest rate of the loan (Hubbard 1998).

Once the contract is stipulated, even though the lender has managed to minimise the risk of adverse selection, he is still uncertain about the behaviour of the borrower in managing the loan. The lender would prefer that the borrower put high efforts to maximise the likelihood of success. However, for the borrower the high effort might be too costly and likely to be hidden to the lender. So moral hazard problems might arise when the borrower decides to put low efforts, increase the probability of failure and transfer the cost of failure to the lender by not repaying the loan. To minimise this eventuality, economic and financial collaterals are requested. However, even under these conditions financial contracts are broken with different frequencies in different contexts or countries.

We argue that prosocial behaviour implies more transparent information during the negotiation process of a financial contract and more cooperation among the parties to respect the terms of the contract. Financial contracts can be considered as an exchange of financial

resources today, such as money, for a promise to return more financial resources tomorrow. Since prosocials are individuals cooperating for the collective gain, they are more willing to avoid situations that could lower the capacity to fulfil a promise. Therefore, prosocials are more reluctant to engage in a credit contract if not enough collateralised (Pirinsky 2012). This precondition of reliable but also "reluctant" borrowers expects to reduce adverse selection and moral hazard problems and, hence, to have a positive effect in the arrangement of the financial contract. Under a more aggregate view, this implies that contexts with more prosocials are more likely to report lower interest rates on loans and lower insolvency rates.

There is an emerging and growing literature showing that individuals do not behave only on the basis of their personal interest but also for the benefit of the collective wealth (Boagert et al. 2008; Torgler 2005). This evidence has particularly been reported in experimental and lab works (Andreoni 1995; Berg, Dickhaut and McCabe 1995; Bowles and Gintis 2002; Sobel 2005). However, to our knowledge there is a limited number of empirical works attempting to associate social attitude with credit market performance.

Ferray (2002) conducts a qualitative analysis about the financing of "Parisian brasseries" by the Parisian banks. He argues that "asocial" scientific methods of risk evaluation and institutional device applied by bankers are insufficient to efficiently reduce the risk related to their lending activities. When a financial counsellor belongs to a social network, he is able to add extra information about potential customers. This allows the lender to use what Ferray (2002) calls a method of social risk evaluation based on the acquisition of the information through the informal relationships the counsellor holds with the rest of the community. This method of course does not substitute the institutional one but it helps the banker in the lending decision process. Guiso, Sapienza and Zingales (2004), instead, investigate the effect of social capital on financial development in Italy. By using outcome-based social capital indices such as electoral participation and blood donation they find that in areas with a higher level of social capital families are more likely to use checks, invest less in cash and more in stock, and have higher access to credit. Hong Kubik and Stein. (2004) analyses the link between social interaction and stock market participation in the US society. By dividing the investors into two types, "non-social" and "social", they find that households that either know their neighbours or attend church have about a 4% higher probability of participating in the stock market than "non-social" households. A plausible explanation is that a social agent finds more attractive to participate in the market when more of his peers do.

This article aims to provide an additional contribution in this direction by exploring for the first time the relationship between prosocial behaviour and credit market performance across the Italian regions. The exploratory nature of this work does not state on the empirical technique adopted, rather on the theoretical framework considered. It is very common to analyse credit market performance within the dominant perspective of the predetermined rational choice context where financial collateral and market uncertainty are the main driving factors of the financial contract success and failures. Without denying the importance of these factors, we stress on the point that the credit contract is embedded in a social exchange context where social and institutional norms play a crucial role. For this reason, prosocial behaviour and legal intervention are essential factors of our specified credit market function.

The prosocial behaviour indicators adopted here are two: the regional proportion of individuals actively involved in voluntary associations and the regional proportion of

individuals that have provided economic help to family members and friends. These indicators are constructed by using secondary data from the reports on "Relatives and Safety Net" produced by the Italian Centre Bureau of Statistics (ISTAT) in 1998 and 2003. There are, at least, two advantages in using these data. Firstly, they do not suffer of self-reported bias due to over-reported prosocial behaviour. Secondly, they allow this work to show interesting regional differences within the same country and help to speculate on potential policy recommendations.

The credit market variables derive from the regional economic reports of the Bank of Italy and they refer to the same years of the ISTAT's reports. The empirical analysis is developed through two different specifications and it uses a two-period panel model. In the first case, the specified empirical model considers the credit variables as functions of the prosocial variables along with economic and financial collaterals. In the second case, the model also includes the ability of legal enforcement. This allows the empirical framework to show two crucial issues: firstly to compare the impact of prosocial attitudes on the credit market variables with and without institutional intervention and detect any substitution effect between institutional and "social" enforcement; secondly to compare these empirical findings with experimental results on strong reciprocity produced by the literature and trace similarities and differences useful for further empirical and experimental research.

The estimation framework provides evidence supporting the positive role of prosocial attitudes in reducing credit market imperfections with and without legal enforcement. In addition, when legal enforcement is included, it seems that the impact of prosocial behaviour is more effective under strong legal enforcement than under weak legal enforcement. This complementary effect between prosocial behaviour and legal enforcement drives to two interesting points of reflections. Firstly, it seems to confirm the mechanism of strong reciprocity tested in experimental works. Secondly, it provides evidence that a more efficient legal framework can act as a more reliable transmission mechanism of institutional norms and facilitate the internalisation of social norms.

This paper is structured as follows: section 2 defines the concept of prosocial behaviour and presents the theoretical rationale on which the relationship between prossocial behaviour and credit market is established; section 3 describes the data, the prosocial and the credit market variables we consider in the specified empirical model; section 4 reports and discusses the empirical findings; section 5 provides and discusses the outcome of the robustness analysis; section 6 concludes

2. Prosocial Behaviour and Credit Market

2.1 Prosocial Behaviour and Cooperation for Collective Gain

This paper is based on the assumption that everything we do in our life, any action, choice and outcome is conditioned somehow by the society in which we live. This is not a new assumption of course rather it is simply the framework within which the majority of social sciences work.

Bowles and Gintis (2002) call this society community. A community is "a group of people who interact directly, frequently, and in multi-faceted ways" (Bowels and Gintis, 2002, p. 420). Colleagues, neighbourhoods, groups of friends, professionals, business networks, gangs and sport leagues are just some examples of communities. The interactions and the relationships among the members of "this" community are the results of the members' behaviours. Some of them tend to behave according to the interests of the community and others according to their own personal goal exclusively. The first type of individuals is called prosocial while the second type is called proself (Bogaert et al 2008). This non-homogeneous behaviour is at the basis of the social dilemma discourse which is about whether the individual decides to cooperate or not. If we think of the classical game of the prisoner's dilemma, a prosocial player would try to maximise the joint outcome and, hence, reach the win-win solution. Proself players, instead, would try to maximise their own outcome and, hence, play defeat-defeat.

Many scholars from different disciplines (social psychology, economics, sociology, political sciences and so on) have been studying this non-homogeneous behaviour in order to understand the reasons at the basis of a prosocially-orientated behaviour (or proself orientation of behaviour). One of the explanations broadly recognised especially in social psychology refers to the interdependence theory (Kelley and Thibaut 1978). This theory states that prosocial individuals are more willing to cooperate because they transform a give situation (i.e. matrix) into an effective matrix on the basis of their internalised norms (Bogaert et al. 2008). Hence, internalised norms are taken into account in the choice behaviour for solving social dilemma problems. This might also explain why prosocials tend to perceive the one-shot prisoner dilemma game as a coordination and not as a compete game as proselfs do (Simpson 2004). Prosocials are also more inclined to cooperate in situations of negotiations. Even though a negotiation does not necessarily imply a social dilemma, it involves an interaction which can easily create a situation of interdependence where one person can take advantage of the other (Bogaert et al. 2008). This is even more likely to occur under a condition of asymmetric information like in the case of the credit markets. For instance, if we consider the ultimatum bargaining game designed by Van Dijk, Cremer and Handgraaf (2004), two players negotiate under two different information conditions: a symmetric information condition where both of the players have the same access to information relative to the dilemma problem they should solve; an asymmetric information condition where one of the players has more access to the pertinent information. The outcome indicates that prosocials tend to cooperate in both conditions while proselfs cooperate only under the symmetric information condition due to the high probabilities of reaching a lower outcome in case of defect choice.

Even though prosocials prefer cooperation to competition, they are conscious of the corresponding risks of exploitation from partners. Two crucial elements are likely to minimise this risk: cooperation under the condition of reciprocity and contextual information deriving from the social environment.

The first element is a coping strategy adopted against free-riders and it is labelled in economics with the term "strong reciprocity" (Bowles and Gintis 2002). This indicates a behavioural propensity of an individual to cooperate conditionally on other group members' cooperation. Prosocials will punish partners' violations of social norms by interrupting the

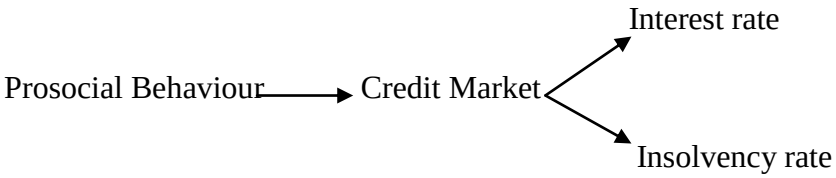
cooperation mechanism even if this might be so costly for the punisher that he/she ends up with an economic loss. By using public games, Fehr and Gintis (2007) find evidence of a relevant share of individuals exhibiting strong reciprocity. In their experiment, individuals involved in the same experiment behave as self-regarding and as cooperative according to whether in the experiment punishment is excluded or included. Consistent with the strong reciprocity mechanism, in the case of financial contracts, we might expect less cooperative behaviour in contexts where legal enforcement (punishment opportunity) is weaker. Indeed, empirical evidence shows that countries with poorer investor protection have smaller and less effective financial markets (La Porta et al. 1997). With respect to the Italian case, Magri (2006) reports that in provinces with weaker legal enforcement the negative impact of the asymmetric information is larger for lenders.

The second element refers to contextual information deriving from the social environment. Signalling others' trustworthiness can represent a crucial determinant of the cooperative behaviour of the prosocials (Bogaert et al. 2008). De Bruin and Van Lange (1999) and Smeester et al. (2003) show that information signalling moral and honest partners evoke more cooperation from everybody. For instance, in the game advanced by Kandory (1991) each agent carries a label (such as reputation, membership, citizenship, credit cards etc…) which transmits the necessary information. In this case, the community somehow "marks" deviators. Under the assumption that the social norm requires that an individual should not cooperate if the potential partner is labelled as a deviator, nobody has an incentive to deviate from the equilibrium path when the punishment is severe enough. This mechanism works, of course, reversely as well. In the case an individual is likely to deal with many deviators in the future, then, the punishment might be costly to carry out and this may destroy the incentive for them to cooperate. In simple words, when the information transmission depicts a community in which dishonest behaviours are likely to dominate, the tendency of respecting social norms is lower. Consistent with this view, in the case of financial contracts we might expect that contexts with a higher proportion of prosocials show also lower insolvency rates. This might be because social norms, such as to keep a promise to repay a loan, are more likely to be respected.

2.2 Prosocial Behaviour and Credit Market: a Theoretical Rationale

The causality diagram of figure 1 depicts the scenario of this research analysis. Let's consider a financial contract between two parties: a lender and a borrower. The theoretical framework of the prosocial attitude implies more cooperation among the two parties in order to comply with the terms of the contract. Hence, the main hypothesis under investigation states that in contexts with more individuals acting prosocially, two main consequences should follow: firstly, borrowers should have access to lower interest rates; secondly, lenders should have to deal with lower insolvency rates.

Figure 1 Causality diagram of prosocial behaviour and credit market



The credit market variables we use to test the causality diagram are calculated by the Bank of Italy at the regional level (Banca d'Italia 1999, 2004) and they are: the average regional interest rate applied for lending to resident (*rate*) in 1998 and 2003 and the ratio between insolvency and lending (*insol*) in 1998 and 2003.

The interest rate is not only an equilibrium price between credit supply and demand, but also a promise to pay an amount in the future (Stiglitz and Greenwald 2003). Unfortunately, "promises are often broken *otherwise* there would be no issue in determining credit worthiness" (Stiglitz and Greenwald 2003, p. 27). Actually, one of the factors that determine high rates is the high costs of screening loan applicants and pursuing delinquent borrowers (Stiglitz 1990). Considering that the bank is risk-neutral, it will set the interest rate on the distribution of clients between risk-averse and risk-lover. The risk-lover borrower is more likely to engage in moral hazard actions and imprudent behaviour at the cost of non-maintaining the promised stipulated with the lender. On the contrary, the risk-averse borrower will adopt a prudent behaviour and minimise the risk of non-compliance condition. Hence, the risk-averse element, refers not only to a pure calculation about the return of the investment project but also to a "backwards" decision taken by the potential borrower in order to avoid the non-compliance condition. This can be due to expected social punishment (reputation severely damaged) or because of social norms in which the borrower believes. For instance, Guiso, Sapienza and Zingales (2011) indicate that even during the current financial crisis more than 80% of the individuals consider a strategic default immoral and wrong. Under these conditions, if the bank receives signals from the pertinent environment about a large proportion of risk-averse individuals, the bank will set a lower interest in order to reduce the probability of attracting mainly risk-lover borrowers.

In a pure descriptive market perspective the insolvency rate indicates the rate of failure in repaying a loan. If we consider the insolvency rate as a tendency of "non-compliance[1]", a context with a larger proportion of prosocials should also record a lower rate of insolvency[2].

[1] This does not necessarily mean a form of "cheating" post-contract. It might be the consequence of a form of cheating pre-contract. Borrowers might cheat on the riskiness of the project, or on their ability in the implementation of the project or simply on their initial willingness to repay the loan.

[2] Of course this explanation is not completely exhaustive since a borrower can become insolvent due to different other reasons mainly related to changes in market conditions. Nevertheless, Fay et al. (2002) record that risk-taking borrowers increase the probability of being insolvent or of facing bankruptcy than risk-averse individuals in US between 1984 and 1995.

In a community with a higher level of cooperation and commitment, individuals "insolvent" might lose reputation not only with respect to the credit institute but also with respect to the rest of the community. In societies where the level of "dishonesty" is quite low, we might expect to find a lower insolvency rate too.

3. Data and Descriptive Statistics

The main sources for the statistical and empirical analysis are regional data produced by the reports on "Relatives and Safety Net" of the Italian Centre Bureau of Statistics (ISTAT) in 1998 and 2003 and the regional economic reports of the Bank of Italy in the same period. The ISTAT report of 1998 is based on a sample of 21,153 households located in 816 counties (*comuni*). The ISTAT report of 2003 is based on a sample of 19,227 households located in 787 counties (*comuni).* In order to minimise the estimation error, the counties are stratified on the basis of their demographic dimension and weighted at regional level. For each county, the households are randomly selected with equal probabilities[3]. This sampling procedure allows the ISTAT to aggregate the data at the regional level without affecting the statistical reliability of the estimates in a cross-regional analysis (ISTAT 2001, p. 99; 2006, p. 95).

3.1 Prosocial Behaviour Variables

As anticipated in the introduction, in our analysis we use two different indicators of prosocial behaviour: associational activity (*vol*) and informal economic help (*econgive*).

The indicator *vol* is the regional proportion of individuals actively involved in charitable organisations as volunteer. These are the individuals that have positively answered to the question whether they have provided help as volunteer in the last 12 months. According to the literature (Irwin 2009; Berigan and Irwin 2011) the proportion of active members of charitable organisations represents a good indicator of aggregate prosocial attitude. Berigan et al. (2011) consider the memberships of voluntary associations an indicator of first-order cooperation indicating individuals willing to contribute directly to the collective effort and hence behaving prosocially (Irwin 2011). Without mentioning the term "prosocial", in his seminal work on social capital in the Italian regions, Putnam (1993) argues that active members of voluntary associations cultivate a habit of cooperation, solidarity and public-spiritendness. This implies a higher level of reciprocity and honesty.

The indicator *econgive* is the regional proportion of individuals that have provided economic help to relatives and friends. The informal economic help provided to family and friends represents an important form of solidarity where the sense of reciprocity might have an important role. Fafchamps and Gubert (2005) and Udry (1994) identify in the inter-personal loan a form of risk-sharing. This occurs especially among individuals with less initial endowment and with a strong sense of community like in rural areas (Fafchamps 2003).

[3] For more details about the sample selection the report can be consulted at the ISTAT website at www.istat.it/societa/comportamenti

Empirical evidence supporting this view is also reported in high income contexts. In fact, Cox and Rank (1992) show that in United States the inter-vivos transfers are strongly motivated by a sense of reciprocity. Uphoff (1999) points out that interpersonal relationships are held by mutual expectations of benefits and sustained by expectations of reciprocity. De Cremer and Van Lange (2001) find that prosocials are generally more concerned about the people that are in need and suffer. In their experiment, De Cremer and Van Lange (2001) report that, compared to self-interested individuals, prosocials feel more responsible to contribute to group interests and that they are "more likely to reciprocate their partner's actions" (De Cremer and Van Lange 2001, p. S5).

According to the regional data from the ISTAT report, the proportion of families providing economic help to relatives and friends in the 1998 was distributed as follows: 3.46% in the North, 2.95% in the Centre and 3.02% in the South. In 2003 this distribution does not change tremendously even though the general proportion of help slightly increases in all the geographic areas (4.28% in the North, 3.95% in the Centre and 4.08% in the South).

The correlation coefficient between the variables of prosocial behaviour is equal to 0.468 and it is statistically significant at 1% significant level.

3.2 Prosocial Behaviour and Credit Market Variables

The reports about the economic trend of the Italian regions published by the Bank of Italy (1999, 2004) depict a country whose credit market is not homogeneous across the regions. Table 1 shows the distributions of banks, in terms of agencies, across the country.

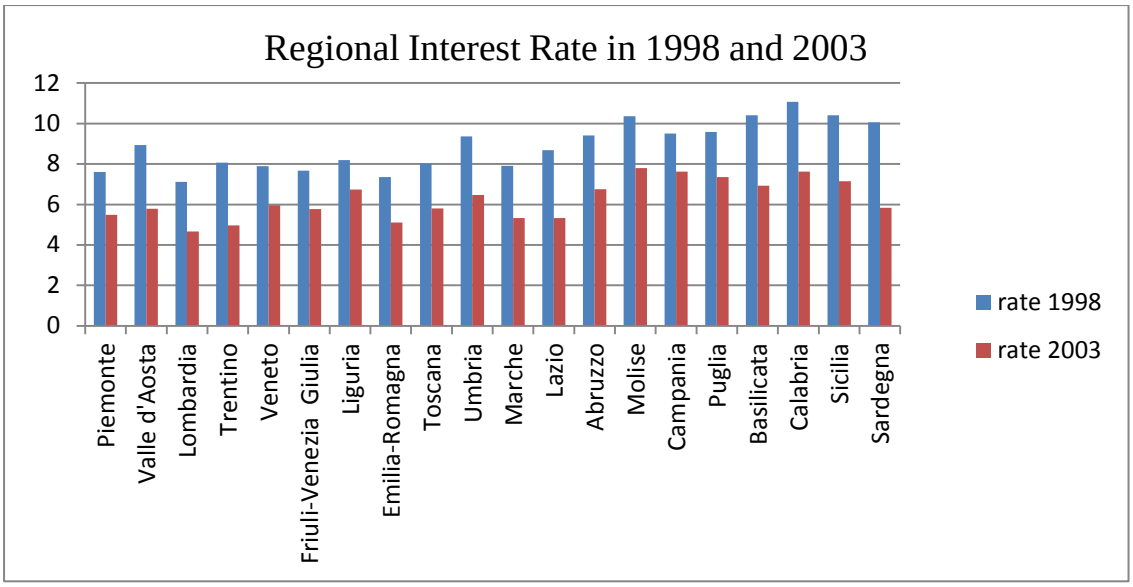
Table 1 Distribution of Banks across Italy in 1998 and 2003

	North	*Centre*	*South*
% banks 1998	57.5 %	19.5 %	23 %
% banks 2003	57.7 %	20.3 %	22 %
Concentration of banks 1998	0.113	0.083	0.047
Concentration of banks 2003	0.131	0.101	0.052

Source: values elaborated from Bank of Italy (1999, 2004)

Between the 1998 and the 2003 the total number of banks in Italy has increased in all the three geographical partitions. However, the northern regions host always more than 50% of the entire banking industry. Still in the North there is the highest concentration of banks (number of banks over hectares) even though the level of concentration is raised also in the Centre and in the South. This bank sector distribution is due to a higher level of industrialisation in northern regions relative to the rest of the country. Also the average interest rates set by the banks and applied for providing credit to what the Bank of Italy calls ordinary clients differ from one region to another. The interest rates charged in the Southern regions (in the histogram from Abruzzo to Sardegna) is generally higher with respect to the rest of the country (figure 2).

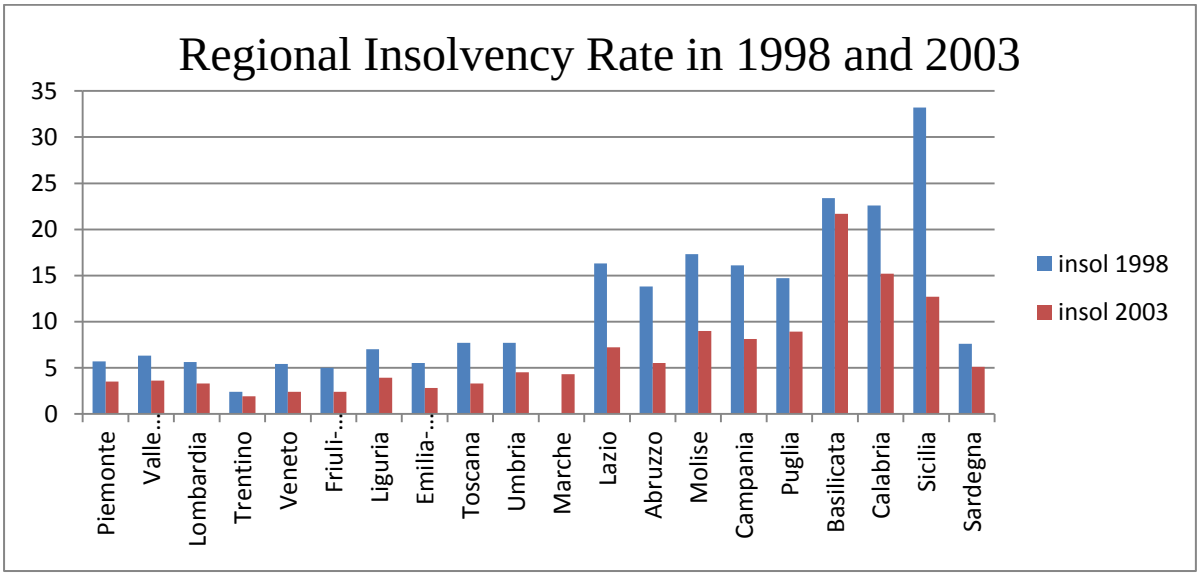
Figure 2 Regional interest rates in Italy in 1998 and 2003



Source: Bank of Italy (1999; 2004)

The direct consequence of a non-repayment solution is to be reported as insolvent. Figure 3 indicates the ratio between insolvent credits and lending across the regions iduring the years 1998 and 2003. The histogram shows that tis ratio decreases across the country from 1998 to 2003. In 1998 most of the southern regions show a very high rate. Some of these regions such as Sicily and Abruzzo, improve dramatically between the two periods.

Figure 3 Regional insolvency rates in Italy in 1998 and 2003



Source: Bank of Italy (1999; 2004)

4. Estimation Framework and Empirical Findings

We follow Magri (2006) and Guiso et al. (2004) and we model regional interest rate (*rate*) and regional insolvency rate (*insol*) as functions of prosocial behaviour (*vol* and *econ_give*), income in natural logs (*lnincome*), deposit (*deposit*) and the regional proportion of self-employees over the total workers (*self*). Table 2 indicates the summary statistics and Table A1 (appendix) describes how the variables are calculated

Table 2 Summary Statistics of the variables

Variable	*Obs.*	*Mean*	*Std. Dev.*	*Min*	*Max*
rate	40	7.551	1.719	4.660	11.070
insol	39	9.041	7.152	1.900	33.200
vol	40	1.922	1.051	0.310	4.750
econgive	40	3.659	0.885	1.860	6.010
lnincome	39	9.482	0.225	9.104	9.815
deposit	40	0.562	0.129	0.062	0.864
self	40	0.312	0.023	0.263	0.374

The variables *lnincome* and *deposit* indicate economic and financial collaterals. Both provide the lender with information about the liquidity capacity of the potential borrower. The proportion of self-employees over total workers is an indicator of job stability. Being a self employee makes the income of the borrower less stable over the time and more subjected to fluctuations of the labour market performances. This might create more uncertainty in order to repay the loan and increase the level of opacity with respect to the lender.

With respect to the interest rate, we expect that interest rates should decrease with prosocial behaviour. A community with a higher proportion of prosocials should have also a high proportion of risk-averse borrowers. This should induce the lender to set lower interest rates. Similarly, the interest rate should reduce with economic and financial collateral and increase with job instability.

Our empirical findings are based on a two-period panel. Notice that we do not use a fixed effect estimator due to two crucial constraints related to our sample. The first constraint is characterised by the small sample size. The sample we use has a limited number of periods (time = 2) with only 20 observations for each period. With a two-period panel when t = 2 and N (number of observations) is not very large, the fixed effect estimator is the same of the first difference estimator. So the main difficulty is that the fixed effect estimator would become too sensitive to variations in models with low degrees of freedom and tends to capture mainly short rather than long run effects.

The second constraint is characterised by the slowly-changing variables of interests of prosocial behaviour. The variables *vol* and *econ_give* changes quite substantially across regions but not tremendously across periods. By including slowly-changing variables in a

two-period model, Wooldridge (2006, p. 475) warns that first difference estimators can be subject to serious biases. In fact, time-invariant as well as slowly changing variables would be highly correlated with the fixed effect (Wilson et al. 2007) and, hence, they will show a high standard error. Recalling Beck (2001) in Wilson (2007, p. 105) "if a variable changes over time, but slowly, the fixed effect will make it hard for such variable to appear either substantially or statistically significant... if an F-test indicates that fixed effects are required, then researchers should make sure they are not losing the explanatory power of slowly changing variables of interest". The main consequence of losing the explanatory power of these variables would be a type II error where something that does matter is rejected (Wilson et al. 2007; Beck 2001).

Table 3 shows the findings of the regression analysis. The first and the third columns are our basic specifications. They indicate the estimation of the prosocial behaviour on interest and insolvency rates.

*Table 3 interest rate, insolvency rate and prosocial behaviour**

	(1) rate	(2) rate	(3) insol	(4) insol
vol	-0.660***	-0.502***	-2.978***	-1.675***
	(0.174)	(0.0714)	(0.519)	(0.627)
econgive	-0.933***	-0.472***	-0.449	-0.158
	(0.211)	(0.136)	(0.510)	(0.511)
lnincome		-4.269***		-21.00***
		(0.415)		(4.644)
deposit		-2.813***		-4.435
		(0.864)		(3.033)
self		4.944		-10.17
		(3.402)		(33.08)
constant	12.23***	50.74***	16.52***	217.9***
	(0.575)	(4.247)	(2.805)	(44.81)
N.	40	39	39	38
R Squared	0.478	0.885	0.110	0.674

* *p<0.1 ** p<0.05 *** p<0.01* Standard errors in parenthesis

* In order to deal with heteroskedasticity and non-equicorrelated errors over time, we use cluster-robust covariance estimator as suggested in Schmidheiny (2012) and Cameron and Trivedi (2005)

In column 1 the prosocial indicators *vol* and *econ_give* are both negative and significant at 1% statistical significant level with respect to the interest rate. Empirical evidence estimates that the interest rate reduces by 0.66% with a 1% increase in prosocial individuals (*vol*). When we consider people providing economic help, it appears that the interest rate reduces by about 0.9% with a 1% increase in *econgive.* Column 2 reports that the coefficient of prosocial behaviour variables is negative and significant when we add economic and financial collaterals, *lnincome* and *deposit,* and the job stability *self.* As expected, economic and financial collateral seem to play a crucial role in the set up of the interest rate. The regression 2 shows that a 10% increase in income will reduce, on average, the interest rate by 0.43%, while an additional 1 million of euros in the deposit will reduce the interest rate by 2.81%.

In Column 3 both of the prosocial variables are negatively related to the insolvency rate even though *econ_give* is not significant in this specification. Column 3 reports that the insolvency rate reduces by more than 2.9% with a 1% increase in active prosocial individuals (*vol*). This negative and significant relationship is still valid even when we include in the baseline specific model economic and financial collaterals like in column 4. This seems to confirm the initial hypothesis that prosocial behaviour might reduce the tendency of breaking the financial promise.

4.1 Prosocial Behaviour, Legal Enforcement and Credit Market

We extend the specified model to legal enforcement ability. Weak legal enforcement might drive the individuals to be less cooperative. So in a more realistic scenario, the decision of breaking or respecting the terms of a financial contract might also depend on the capacity of legal enforcement. We can reasonably expect that a stronger legal enforcement might work as a threat for the risk-lover borrowers since it increases the opportunities to be punished.

Both empirical and experimental evidence reports higher level of compliance in contexts with stronger regulatory capacity. Fry and Torgler (2007) and Torgler (2004, 2005) report that citizens consider tax evasion more immoral than in contexts with a weaker rule of law in both high and low income countries. Given different probabilities of detection, experimental evidence shows that tax payers subject to low probability of detection tend to consider evasion less unethical than tax payers subject to high probability of detection (Blanthorne and Kaplam 2008). In a lab experiment, Fehr and Gintis (2007) show that under punishment opportunity strong reciprocity is more consistent and cooperative behaviour is internalised. The interesting point of this outcome is that also under non-punishment opportunity cooperation exists. However, the authors warn that this cooperation might stop in cases where cooperative values are not strong enough and free-riders keep on being unpunished. So under non-punishment condition if the proportion of free-riders increases then also cooperative individuals tend to stop cooperating.

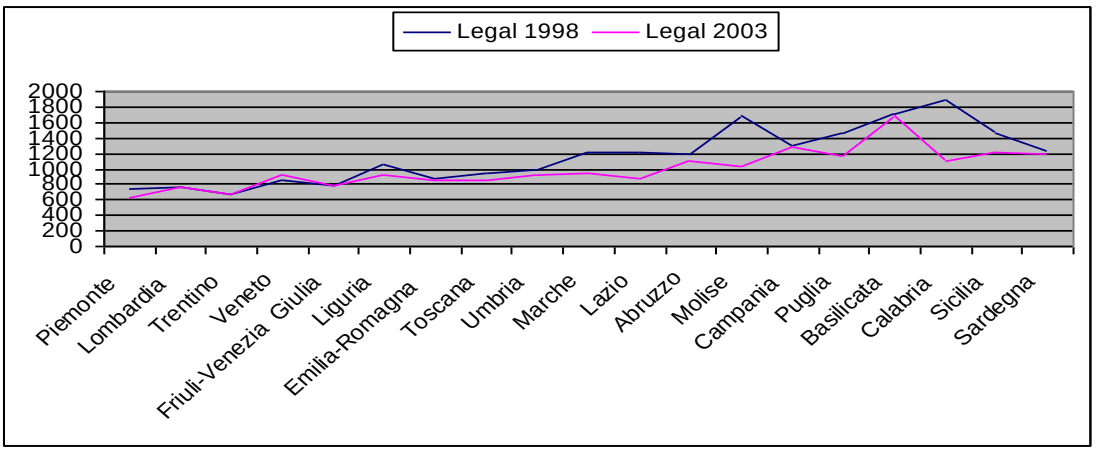
Within a credit market scenario, contexts with weak legal enforcement might face a higher concentration of risk-lovers with more opportunity to break the promise of the financial contract. In the analysis of long-term maturity debt and the supply of credit for the Italian firms, Magri (2006) argues that the quality of the legal system may affect the financial decision of the lender in supplying funds. Where the lender feels more protected by the juridical institutions the problem of adverse selection and moral hazard are reduced especially in the final stage of non-repayment of the borrower.

To this purpose Italy represents an interesting case study. The different regions are subject to the same legal system and, with particular attention to the credit market, to the same bankruptcy code. However, it seems that the degree of legal enforcement varies across the regions (figure 4). Following Guiso et al. (2004), we use as indicator of legal enforcement (*legal*) the regional average length of time (number of days) to complete a first degree trial by the courts.

Figure 4 shows that the length of time to complete a first degree trial by the courts differs quite significantly across the regions. In the 1998 in the North in order to complete the first degree trial it takes more than two years while in South it takes about four years. Between

the 1998 and 2003 the country experiences a slightly average improvement even though variation across regions still occurs.
On the basis of the literature (Guiso et al. 2004; Magri 2006; Omiccioli 2005) we consider a legal system to be less efficient when the average period is longer so when the coefficient of *legal* is higher. For instance, in regions where the length of time to complete the first degree trial is around four years, the legal enforcement is weaker than in regions where this period is reduced to two years.

Figure 4 Legal enforcement in Italy 1998 and 2003



Source: ISTAT

Table 4 reports estimations of the prosocial behaviour and legal enforcement indicators on the regional insolvency rate.

*Table 4 Estimations of prosocial behaviour and legal enforcement on insolvency rate**

	(1) insol	(2) insol	(3) Insol
legal	0.0195***	0.0158***	0.0125***
	(0.002)	(0.002)	(0.004)
vol		-1.501***	-1.310**
		(0.498)	(0.645)
econgive		-0.280	-0.621
		(0.580)	(0.775)
lnincome			-8.022
			(6.235)
deposit			-2.986
			(4.198)
self			-48.42*
			(26.17)
constant	-11.68***	-3.755	93.46
	(2.227)	(2.322)	(61.31)
N.	37	37	36
R Squared	0.718	0.728	0.784

* *p<0.1* ** *p<0.05* *** *p<0.01* Standard errors in parenthesis

* In order to deal with heteroskedasticity and non-equicorrelated errors over time, we use cluster-robust covariance estimator as suggested in Schmidheiny (2012) and Cameron and Trivedi (2005)

Column1 shows that weak legal enforcement is positively and significantly related to the regional rate of insolvency at 1% statistical significant level. Empirical evidence shows that a delayed of 100 days in the legal procedures increases the insolvency rate by about 1.95%. Column 2 shows that when we include the variable *legal* the indicator of prosocial behaviour *vol* is still significant even though the coefficient is slightly lower. In fact the insolvency rate decreases by 1.5% with an additional 1% increase in prosocial individuals.

Column 3 shows that the variables of legal enforcement and of prosocial behaviour keep the same relationship with the insolvency rate even when we include economic and financial collateral and job stability.

The empirical analysis does not report the functional form of the interest rate. This is because the variable *legal* does not result significant with respect to interest rate. It seems that the decision of the bank to set the interest rate is not affected by the level of legal enforcement.

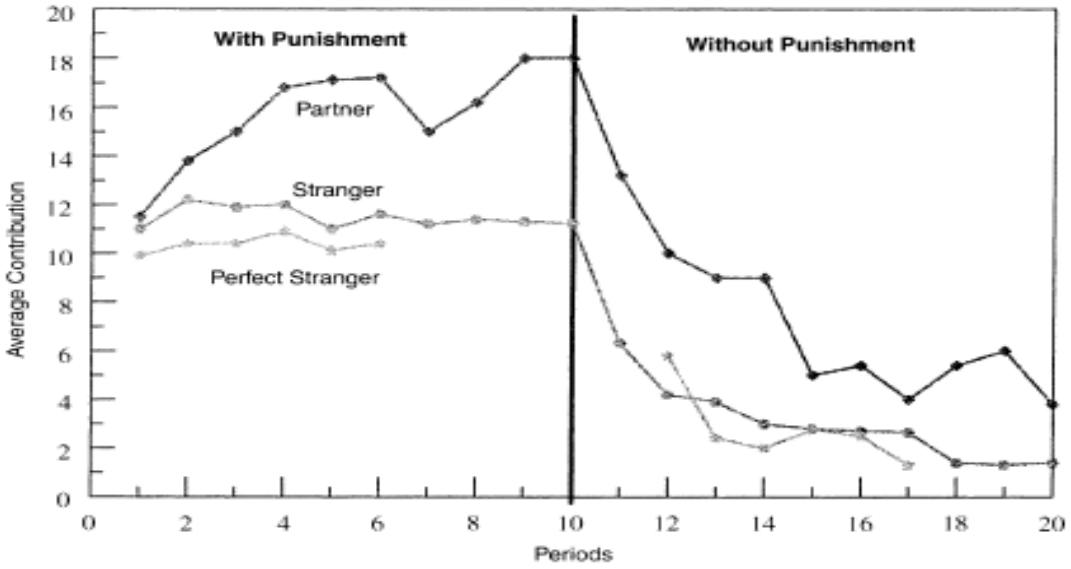
5. Robustness Analysis: Is It Only a Matter of Punishment?

We conduct a sensitivity analysis to address the issue of the robustness of our findings. The analysis considers two different issues. Firstly we check whether our empirical findings confirm the experimental results of the literature of strong reciprocity and we discuss the transmission mechanism of institutional norms provided by the legal enforcement. Secondly, we estimate the specified empirical model by using a dynamic two-period panel where we take into account serial correlation and potential over-time persistence of the data as suggested by Beck and Katz (1996).

5.1 Cooperation with and without punishment

Recalling the experimental results of some evolutionary works, individuals seem to cooperate more effectively under punishment condition compared to the case in which punishment is absent. One of the most popular lab experiments, in this sense, is the one conducted by Fehr and Gachter (2000). The structure of the experiment is a ten round public good game with costly punishment and without punishment. They consider three different methods of assigning members to groups: *personal treatment* where the players remain in the same group for all the ten rounds; s*tranger treatment* where the players are randomly reassigned after each round; *perfect stranger treatment* where the players are reassigned not randomly but such that they will never meet another player more than once (the rounds are reduced to six instead of ten). Figure 5 illustrates that, despite strict anonymity, when costly punishment is permitted, cooperation does not deteriorate and it almost becomes full cooperation. When punishment is not permitted then cooperation falls after a few rounds.

Figure 5 Experimental results with and without punishment



Source: Fehr and Gachter (2000)

We test whether the estimation framework of this paper can confirm the experimental results. We are conscious that there exist differences between lab experiments and empirical "field" works. For instance, the lab experiment can minimise the noise caused by contextual factors of the "real-world" such as reputation and non-anonymity. These two factors can condition the prosocial behaviour of the individuals (Levitt 2007). Other factors such as community norms, past experience, continuous repeated inter-personal relationships belong more to the "real-world" than to a lab. In other words, the bottom line message is that context matters and it cannot be fully controlled by the experimental design (Levitt 2007). For this reason it becomes crucial to compare the outcomes of the same theoretical framework achieved through different methodological processes. This should contribute to reinforce the findings of both of the processes.

Unlike the lab, in the "real-world" field we cannot create two parallel scenarios such as one with punishment (immediate legal enforcement) and one without (complete absence of legal enforcement). However, we can consider contexts with different probabilities of getting punished. If we limit the range of probabilities into two binary conditions (high probability of being punished/strong legal enforcement and low probability of being punished/weak legal enforcement) then we get very close to the lab experiment design. To this purpose we construct two binary variables of legal enforcement (*dlegal1* and *dlegal2*) from our initial variable *legal*. *dlegal1 = 1* indicates the regions whose average time of completing the first degree trial is less than the median time and *dlegal1 = 0* otherwise. *dlega2 = 1* indicates the best performing 25% (first quartile) of the regions with the lowest time to complete the first degree trial and *dlegal2 = 0* otherwise. Considering the median, the line that distinguishes regions with weak legal enforcement from regions with strong legal enforcement, *dlegal1 = 1* indicates regions with a relative strong legal enforcement. When we skewed even more the

proportion toward strong legal enforcement the first quartile distinguishes the regions with a relative strong legal enforcement (*degal2 =1*) from regions with a relative weak legal enforcement (*dlegal2 = 0*). Of course, when we shift the separation line from the median to the first quartile we become more demanding in terms of legal enforcement.

We estimate and we plot predicted probabilities of the impact of prosocial behaviour on insolvency for the two different ranges of legal enforcement, *dlegal1* and *dlegal2* (figure 5).

Empirical evidence seems to confirm the experimental results at least in three main points. Firstly, the downward slopping curves in figure 6.A and 6.B indicate that insolvency rate decreases with prosocial behaviour. Secondly, it seems that the cooperative behaviour is wider under stronger legal enforcement. This is captured by the shift of the curve to the right in both of the cases. Finally, the prosocial behaviour curve is more downward sloppig when we consider a even stronger legal enforcement condition. This indicates that the impact of the cooperative attitude on breaking the financial promise is even stronger in context with very high probabilities of being punished. Overall, as in experimental works, empirical evidence indicates that social cooperation is complementary of institutional intervention. Where institutional intervention is less uncertain, social cooperation is more effective.

Figure 6 Predicted probabilities of prosocial behaviour and legal enforcement for insolvency rate

Figure 6.A dlegal1

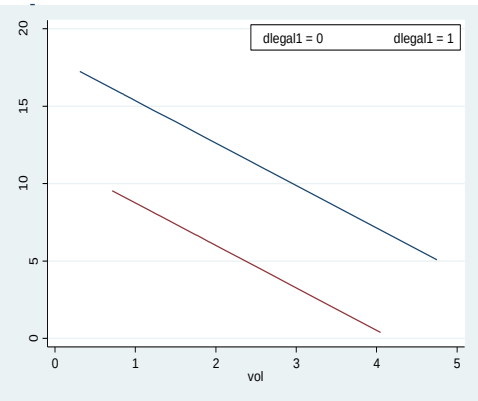
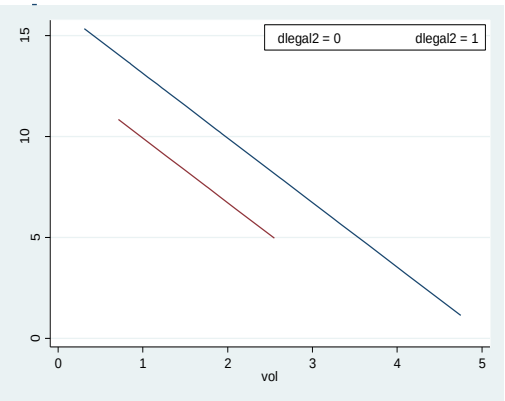


Figure 6.B dlegal2



This complementary effect of prosocial and legal variables should be viewed beyond the punishment perspective.

The legal framework can represent an efficient transmission mechanism of institutional norms that can be internalised by the community especially in a medium and long run term. One of the shortcomings of the interpretation of the experimental and game theoretical outcomes is that cooperative behaviour is mainly explained through the punishment strategy. If this view might be plausible in the short run, in the long run this might fail to capture the importance of the legal framework as transmission mechanism able to internalise institutional norms as “moral imperative”. This recalls the position assumed by Brennan and Buchanan (1985) that consider the punishment not only a simple “prize” of an alternative strategy (or opportunity cost) but also a symbol that connect the illegal behaviour with the moral

dimension. In other words, it indicates what is considered "wrong". In this sense a more efficient legal system is more likely to transmit a stronger sense of law abidance that goes beyond the simple punishment-opportunity cost. Orviska and Hudson (2002) provide an interesting critical discussion about the distinction between law abidance and civic duty. While the former is more related to objective responsibilities define by the law, the latter refers to subjective responsibilities within a code of conducts and behaviours. They argue that both determine moral attitudes since, if both violated, they can provide an individual with a feeling of guilty for having committed a wrong act and for having failed in complying with recognised ethical rules (Orviska and Hudson 2002).

5.2 Over-time persistence: Lagged Dependent Variable version of the model

We conduct a sensitivity analysis through a dynamic two-period panel. We follow Beck and Kats (1996) and we take into account serial correlation by including a lagged dependent variable LDV among the regressors. This is because we might face over-time persistency in the data and the lagged dependent variable might estimate the extent of the persistence in the dependent variable[4].

Table 5: estimation framework with the LDV version

	(1) rate	(2) rate	(3) insol	(4) insol
vol	-0502***	-0.386***	-1.310**	-1.105*
	(0.071)	(0.095)	(0.645)	(0.594)
econgive	-0.472***	-0.420***	-0.621	-0.799
	(0.136)	(0.145)	(0.775)	(0.689)
lnincome	-4.269***	-3.639***	-8.022	-2.103
	(0.415)	(1.018)	(6.235)	(5.237)
deposit	-2.813***	-2.518***	-2.986	-6.391
	(0.864)	(0.837)	(4.198)	*8.306)
self	4.944	6.202*	-48.42*	-64.57**
	(3.402)	(3.605)	(26.17)	(32.41)
rate_1		0.190		
		(0.158)		
legal			0.0125***	0.0134***
			(0.004)	(0.004)
insol_1				0.143
				(0.253)
constant	50.74***	42.33***	93.46	42.30
	(4.247)	(11.54)	(61.31)	(50.58)
N.	39	38	36	34
R Squared	0.885	0.892	0.784	0.788

** p<0.1 ** p<0.05 *** p<0.01* Standard errors in parenthesis

[4] In the last decade there has been wide debate about the consistency of the suggestions proposed by Beck and Katz (1996). This debate is accurately discussed in (Wilson et al. 2007). A criticism is to include a LDV in a OLS model as originally suggested by Beck and Katz (1996). This would make the OLS estimators inconsistent. We limit this problem because we apply the LDV to a two-period panel and not to an OLS. This different structure should not affect inconsistency. On the contrary this will include time-persistent information in our original model. The advantage of this procedure is to get closer to our original data than transformed data would do (Podesta' 2006).

Table 5 reports the estimates with and without the LDV.
Table 5 shows that the impact of the control variables of interest (*vol*, *econ_give* and *legal*) does not change when we include the lagged dependent variable among the regressors. In addition, it seems that the lagged variable does not have any significant impact on the dependent variable. It seems that the period of 5 years, which is the time gap between t = 1 and t = 2 in our model, is long enough to minimise over-time persistency.

6. Conclusions

The hobbesian solution to collective action problems is based on government coercion so that every individual is legally constrained to contribute to the public good. However, "the need to monitor government is the second-order collective action problems to which government coercion cannot be the solution" (Knack 2002, p. 773). In simple words, the missing link in Hobbes' analysis is the positive role of the community. Due to lack of vertical and horizontal information government and markets fail in their targets. The empirical findings reported in this work indicate that internalised social norms along with institutional legacy can reduce the effects of this lack of information. Contexts with more individuals acting prosocially, report lower bank interest rates for loans and lower insolvency rates. As in experimental economics, our findings show that under more efficient third party enforcement, the compliance toward the contract is higher. However, our interpretation goes beyond the simple short run opportunity cost approach. A more efficient legal system is more likely to transmit a stronger sense of legal abidance that along with prosocial variables determine attitudes of cooperative behaviour.
This might draw attention to at least two important issues. Firstly, Bowels and Gintis (2002) define "community governance" as the system of social norms and rules "regulating" the behaviour of its members. So "community governance" should be taken into account when governments set economic and financial plans. Investing in prosocial activities might become a good strategy to reduce market uncertainty. Secondly, following Stiglitz (1990), legal reforms should provide lenders with more security for the recovery of their loans. A better legal system might represent a positive signal to individuals, leading to an increase in cooperative behaviour and a reduction in free-riding problems.

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Appendix

Table A1 (Variables)

Dependent Variables	*Description*	*Source*
Rate	Average regional interest rate applied for lending to residents	Bank of Italy
Insol	insolvency / lending	Bank of Italy
Independent Variables	*Description*	*Source*
Vol	Percentage of individuals involved in associational activities as volunteer. *Did you provide help as a volunteer?*	ISTAT
econgive	Percentage of individuals that have provided economic helps to family and friends during periods of economic difficulties	ISTAT
deposit	Deposit / Value Added	ISTAT
lnincome	Natural log of income per capita	Eurostat
self	independent workers / total workers	ISTAT
legal	Regional average length of time (in terms of days) to complete a first degree trial by the courts.	ISTAT
dlegal1	*dlegal1 = 1* regions whose average time to complete the first degree trial is above the median time *dlegal1 = 0* otherwise	Author re-elaboration from the variable *legal* (ISTAT)
dlegal2	*dlegal2 = 1* regions of the first quartile with respect to the average length of time to complete a first degree trial by courts *dlegal2 = 0* otherwise	